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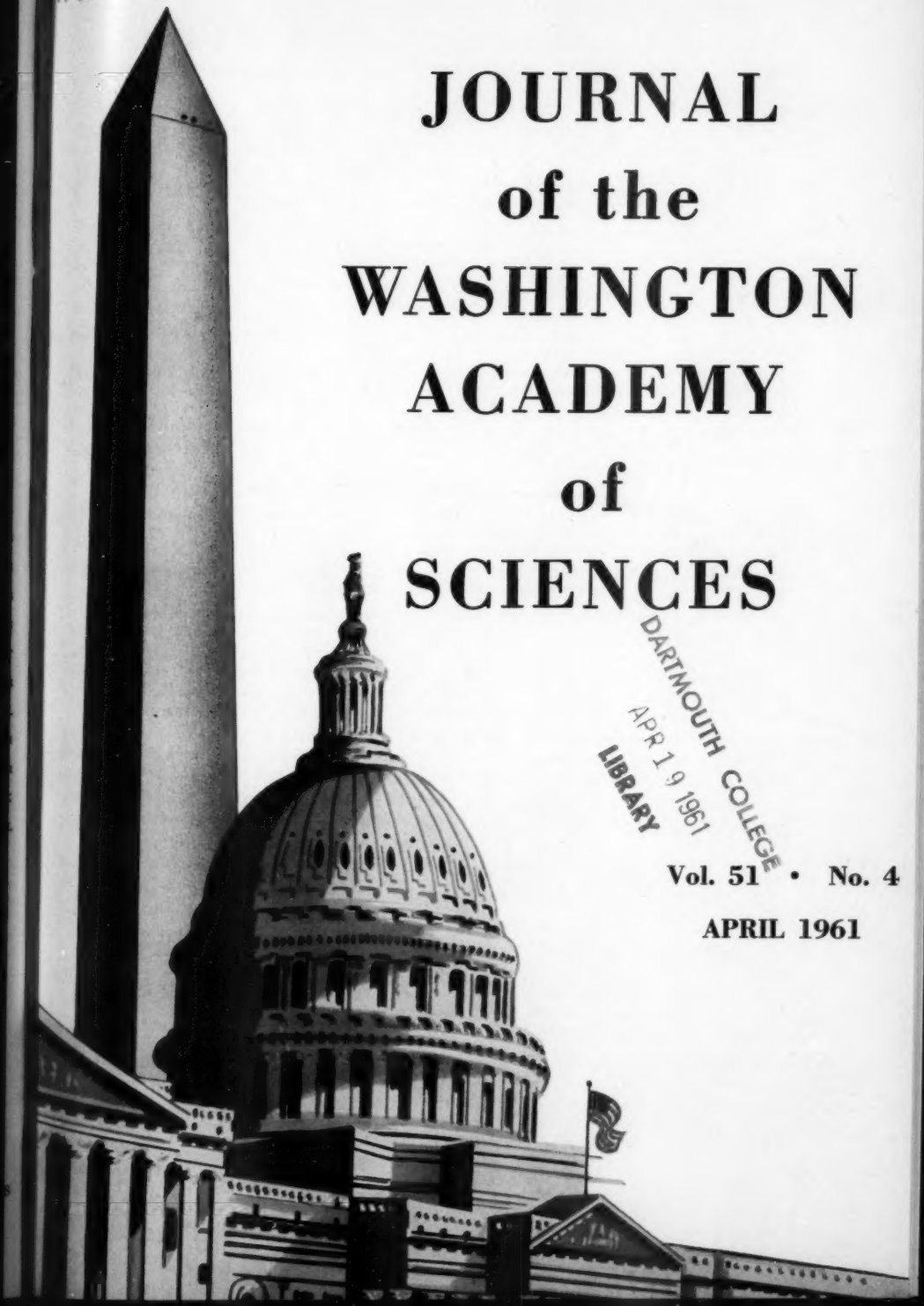

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JOURNAL OF THE WASHINGTON ACADEMY OF SCIENCES

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This Journal, the official organ of the Washington Academy of Sciences, publishes historical articles, critical reviews, and scholarly scientific articles; notices of meetings and abstract proceedings of meetings of the Academy and its affiliated societies; and regional news items, including personal news, of interest to the entire membership. The Journal appears eight times a year in January to May and October to December.

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Geology and Geologists in Fiction*

Mark W. Pangborn, Jr.

The geologist, on reading today's novels, dealing with business man, soldier, or artist, may wonder just what sort of literature has been written about his own profession. Let us take a quick look at 20 or so adult novels in English which most clearly feature geology or geologists, and see for ourselves just how our science fares. We will first consider escape literature, including science fiction, adventure novels, and detective stories.

The earliest appearance of geology in science fiction must surely be in Jules Verne's novel, *A Journey to the Center of the Earth*,[1] originally published in 1864 and reprinted in English many times. In it the narrator and his uncle, Professor Hardwigg, descend into the crater of Mount Sneffels, in Iceland, and, proceeding downward, discover that the earth's interior is hollow and inhabited by mammoths, plesiosaurs, and the like. This hollow earth theme has been used by other authors, notably Edgar Rice Burroughs, who built a whole series of lurid romances around Pellucidar and its grisly inhabitants. Of them the less said the better.

Conan Doyle's *The Lost World*,[2] however, is a most convincing novel about the survival of extinct species into modern times. In it the explorer-geologist George Edward Challenger leads a party to a great plateau hidden in the Brazilian back country; the top of this plateau is populated by dinosaurs and ape-men, among whom our adventurers have experiences which would overwhelm less stout hearts. As one might expect, the creator of Sherlock Holmes brings his characters vividly to life. One of them, the atrociously overbearing Professor Challenger, made such a hit with the public that Doyle made him the hero of several short stories. In one of them, *When the World Screamed*,[3] Doyle definitely anticipates the Mohole by 45 years.

Another shining example of science fiction is *You Shall Know Them*,[4] by the French novelist Vercors, in which a scientific expedition discovers the man-ape, *Paranthropus erectus*, in the New Guinea jungle. No expedition, including the voyage of the Beagle, ever brought back more trouble. In a moment of weakness the expedition journalist is persuaded to take part in a great scientific experiment: by means of artificial insemination he finds himself mated to a female *Paranthropus*, and a father. Seized with remorse, the journalist murders his son and dares the police to do anything about it; the police do, and the remainder of the book deals with the ponderous efforts of British justice to determine whether or not the hybrid is *Homo sapiens*, living under the laws of God and man. We wonder why the author, working his hilarious vein, found it necessary to describe the party's geologist, Dr. Kreps, as resembling "a pachyderm, with a walrus moustache . . . with a voice, high and fluting as a young boy's."

In eight or ten rather unconvincing novels man and prehistoric beasts are brought face to face by means of gadgetry. In the best known of these tales, *Before the Dawn*,[5] by Caltech mathematician Eric Temple Bell, scientists build a "time reversal machine" and are rewarded by glimpses of gory battles between dinosaurs. A better example is L. Sprague De Camp's delightful short story, *Employment*,[6] in which paleontologist Gill Pratt discovers how to reconstitute prehistoric animals from their bones by electrochemical means; he begins by reconstituting *Castoroides*, a rather innocuous mammal of the late Pleistocene; you can imagine the security problems faced by his har-

* Condensed from a talk given before the Geological Society of Washington, January 11, 1961.

assed staff as Pratt works back into the Mesozoic.

Another popular form of science fiction depicts the lives and times of early man. Most of this literature has been written for boys, who find this *genre* quite irresistible; a few titles, like Vardis Fisher's *Darkness and the Deep*,[7] may appeal to adults.

A Journey in Other Worlds,[8] written in 1894 by John Jacob Astor, is especially interesting, for in it we have the first fictional appearance of that now familiar figure, the government geologist called in to offer advice on major undertakings. In the year 2000, Professor Cortlandt, an "able man . . . with high forehead, greyish hair, and quick grey eyes" is the technical advisor to the Terrestrial Axis Straightening Corporation. This organization has discovered the powerful force "apergy," and hopes to use it to straighten the earth's axis from 23½ degrees to 0 degrees, thereby giving the earth a more uniform temperature. The Professor leads an expedition in an apergy-driven rocket to Jupiter and Saturn, which are still deep in the Mesozoic. Fortunately the book ends before the earth's axis is tampered with.

Those interested in the larger problems of geology may enjoy *The Frozen Year*,[9] by James Blish, which is concerned with the most publicity mad and poorly organized expedition ever to seek and get the sponsorship of the I.G.Y. Committee. If we do not approve of the management of this ill-starred expedition, I am sure that all of us will sympathize with its members as they sit, shivering, around a hole in the Polar ice, fishing tektites off the floor of the Arctic Ocean.

Geologists appear occasionally in the straight adventure novel. Among the very best is *Morgan's Mountain*,[10] by Arthur Mayse, in which a most attractive young geologist rescues a pilot and his daughter who have crashed in the wilds of British Columbia. In similar vein is Lawrence Earl's *The Frozen Jungle*,[11] in which the last party to fly out of a Labrador mining camp is forced down and must spend a frightful winter in the wilderness; the geologist, an alcoholic because of war experiences, turns out to be the strongest character of the little group, and is purged of his neurosis as he leads the castaways to safety the following spring.

Volcanoes and earthquakes have been the villains of many adventure stories since the days of Bulwer-Lytton's *Last Days of Pompeii*. Most of these tales are pretty corny, but Dale Van Every's description of the New Madrid quake, in *The Trembling Earth*,[12] is as graphic an account of a natural phenomenon as has ever been written.

Most stories about caves are written for youngsters. The adult literature is not abundant, nor is it convincing, with the exception of Andrew Garve's *A Hole in the Ground*.[13] This is a thrilling story of spelunking in northern England, in which the villain is an unstable politician with Communist leanings, and the hero a charming and enterprising petroleum geologist who eventually makes off with the politician's wife.

There must be nearly a thousand adventure novels with a mining background. Most of these are "westerns" or "northerns" in which the prospect is nothing more than a hook on which to hang a story, or are sociological tracts dealing with mine hazards or labor troubles. Less than a hundred have solid technical or historical backgrounds. The hero is almost invariably a clean, two-fisted, half-educated chap who foils the claim jumpers and wins the maiden's hand, but in *his* rare appearances the geologist's role is not always a happy one.

He first appears in 1886 in *John Bodewin's Testimony*,[14] Mary Hallock Foote's novel about contested mine ownership. The government geologist, Hilbury, is obviously modelled on Clarence King, and is flatteringly portrayed as a man "who might turn up almost anywhere . . . at the swell clubs in New York and Lon-

don . . . or at the President's reception, or digging his way up some mountain peak above snow line."

The hero of *Silver City Heyday*,[15] by William Kehaly, is the brilliant exploration geophysicist, Pierce Grant, whose technique and instrumentation are so advanced that he is able to block out a number of splendid ore bodies. Like all of us, Grant is frustrated by the income tax situation, but he takes the wrong turn and operates what is known as a moonlight mill. A nosey Treasury agent is accidentally killed, Grant takes it on the lam, and I am sorry to say that our gifted colleague is dropped by the sheriff's guns.

Surely the most unethical of fictional geologists is Bates Wallen, who sells his services to two rival outfits in Luke Short's excellent western, *Rimrock*.[16] The book's hero, a trusting paint salesman turned uranium prospector, can't understand why his big rival is picking up all the best claims, but eventually he catches on, and poor Bates has a rough time. Licensing might have prevented this mess.

There must be at least 300 adventure novels dealing with oil. Perhaps some 30 titles are soundly based in petroleum history or technology, and in eight or ten of them we see the form of the geologist. Usually he plays a minor role, for the hero, as in the mining novel, is almost invariably a half-educated youth who triumphs in the face of liquor, women, and skulduggery. But not always, for in William Heyliger's novel *Wildcat*,[17] in which the details of prospecting and drilling are beautifully drawn, the heroes are two resourceful young geophysicists who put all their savings on a flyer and strike oil.

Perhaps a score of detective stories feature earth science backgrounds, and in six or eight of them geologists play important parts. In Frances and Richard Lockridge's *Dead as a Dinosaur*,[18] a dedicated vertebrate paleontologist is murdered as impatient members of his family try to prevent him from squandering all his money on the scientific expeditions of the Broadly Institute of Paleontology, "across the Park from the American Museum."

Murder in Fiji,[19] is one of two outstanding whodunits by news-analyst John W. Vandercook. In it the villain discovers gold-bearing andesite deposits, then is forced into several murders, hoping to prevent his secret from leaking; the Fiji government geologist breaks the case by correlating the murder localities with the andesite deposits as shown on his geological map. The other story, *Murder in New Guinea*,[20] features a maladjusted geologist with Communist leanings. This fellow discovers a fabulously rich uranium lode, and is then forced to do away with a succession of prospectors who blunder onto his secret; Vandercook's team of detectives get their man with the help of a Geiger counter, for he has become highly radioactive from packing samples of rich ore over the mountains.

The foregoing titles are essentially escape novels, which stress action and plot rather than the character of the scientist, who is only a device to move the plot along. The following four novels, however, are "serious," for in them the authors have attempted to give their geologists authentic personalities, and to fit them into a real world.

A rather charming historical novel is Caroline Dale Owen's *Seth Way*.[21] In it William Maclure discovers the unlettered boy Seth Way in a backwoods cabin, is impressed with his native abilities and thirst for knowledge, and gives him a scientific education. Seth develops into a competent conchologist and geologist, and becomes a leading light in the famed New Harmony community and a colleague of David Dale Owen and Thomas Say, on whom he is modelled.

In his novel *The Return*,[22] Herbert Mitgang draws an earnest if not completely convincing portrait of the geologist whose conscience won't let him be a good company man. Joseph Borken cannot accept,

in good grace, the presence of a prominent ex-Nazi in the New York office of the large mining firm where he works, so he gets himself transferred to Sicily, where he prospects for carnotite; while there he associates with some of the poorer Italians, and comes to share their hopes for land reform. His mere presence at a political rally threatens to compromise his value to the company, so Borken resigns in disgust and goes into business for himself. We might note here that the fictional geologist is notably restrained in matters of sex, if not positively frigid, but Mitgang's novel contains the only known geologists who really relax on Saturday night.

The hero of James Aldridge's excellent novel, *The Diplomat*,[23] also is troubled by his conscience. Micropaleontologist MacGregor, who has been brought up in Persia and speaks fluent Persian and Russian, is selected to serve as translator and advisor to a British diplomat, and accompanies him on a mission to Azerbaidjan in 1946 to see if the Russians are actually supporting the rebellion of that year. The politically-naive MacGregor is disturbed by the fact that his diplomat boss is more interested in saving Persia's oil for the British Empire than in reporting the findings of the mission with scientific accuracy. Amidst a great scandal MacGregor denounces Britain's selfish role in Persia, and returns to his adopted country as a geologist.

Our profession gets perhaps its blackest eye from Honore Willsie, editor of the old *Delineator* magazine and purveyor of western romances to the rocking chair brigade. Her novel, *The Exile of the Lariat*,[24] is concerned with Hugh Stewart, a confirmed vertebrate paleontologist who lives what ought to be a very satisfactory life exhuming skeletons for museums. He faces a real problem, however, for throughout the book his wife, in-laws, and friends constantly badger him to get into a more "rewarding" profession, such as politics, where he can make use of his winning personality to benefit the citizens of his state! Eventually he is euchered into running for Governor of Wyoming, in order to prevent the hydro-power lobby from flooding his finest fossil bed. Stewart wins the election, but his experiences with the State welfare program convince him that his old profession is basically anti-social, and he becomes the biggest dam-builder and do-gooder in the State. If this contrived and discouraging novel proves anything, it is that the authoress, like a lot of her readers, prefers the practical man to the egghead.

It would be foolhardy to attempt to draw any composite portrait of the geologist from our small sampling. We would be on safe ground, however, if we admit that the image of the fictional geologist is not as good as we would like it to be. Yet, if we must rank his image below that of the civil engineer,[25] the doctor, or the artist in any professional popularity contest, he surely stands above, say, the fictional politician or the man in the grey flannel suit.

The nuclear scientist [26] has been the subject of several worth-while novels in recent years. We can hope that the geologist, too, will receive similar attention from thoughtful writers, whether scientist or professional novelist. Unhackneyed plots are abundant. For example, no novels have ever been based on the exciting lives that our pioneering geologists led in the Old West. No author has ever pitted an honest State geologist against the politics and disappointments that sometimes crop up in State capitals, nor has matched an enthusiastic field man against a neurotic wife who resents his long absences. The problems faced by the female geologist who invades what is essentially a man's profession must be worthy of a novel; can we ignore the perils that face her in the field?

If anyone doubts that a scientist should dabble in anything so subjective as literature, be assured that creative writing is now regarded with favor in high places: a government geologist who recently submitted a bit of science fiction to his superiors

had it returned with the comment that it was among his best work.

It seems likely that the rising interest in the personality and activities of the scientist will result in more and more stories about our profession. If it is too much to expect another *Arrowsmith*, with the geologist as protagonist, let us hope that at least some of these future novels will be meaningful to both the scientist and the public, and adequately reflect the thirst for knowledge, the critical outlook, and the self-dedication that sets the scientist apart from the average man.

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Academy Honors Twenty-one Students

The March meeting of the Academy, held jointly with the Washington Junior Academy of Sciences, was the occasion for the presentation of Certificates of Merit to 21 high school seniors in this area. The group was cited for exceptionally meritorius achievement in the 1960 Westinghouse Talent Search.

At a dinner held at the Fairfax Hotel preceding this meeting, the students and their teachers were guests of the Academy. Those present included the officers of the Academy and members especially interested in encouraging science talent. B. D. Evera of George Washington University, president-elect of the Academy, spoke briefly to the group on the importance of undergraduate education and the increasing need for broad preparation for scientific research.

At the general meeting held in the John Wesley Powell Auditorium of the Cosmos Club, President Philip H. Abelson presented the certificates to the students. A Symposium on Recent Significant Advances in Science followed, in which Christian B. Anfinsen, Jr., of the National Institutes of Health discussed biology after which Joseph Weber of the University of Maryland spoke on physics. Both speakers described major problem areas to which the students might expect to contribute upon completion of their collegiate training.

The students receiving the Certificates of Merit are as follows:

Thomas G. Andrews, Jr. (Bladensburg), Robert C. Bost, Jr. (Washington-Lee), Marta A. Burns (Immaculata), John M. Cone, Jr. (F. C. Hammond), Leland G. Dobbs (Sidwell Friends), Michael J. Finegan (Fairfax), Dennis W. Herrin (Anacostia), Edward C. Jones (Wakefield), Steven L. Jordan (Montgomery Blair), Margaret E. Kottke (Bladensburg), David H. Malin (Walter Johnson), Rosalie A. McCanner (Woodrow Wilson), David C. Mendelson (Western), Margaret A. Nelsen (Richard Montgomery), Michael C. Newlon (Western), Andrew R. Phelps (Sidwell Friends), Mary M. Shaw (Walter Johnson), Thomas M. Souders (McLean), Barry L. Sperling (McLean), Henry L. Vacher (Western), Robert L. Waymost (Bethesda-Chevy Chase).

A Staff Report—

The California Academy of Sciences

In large part, the California Academy of Sciences is to San Francisco and its tourists as the Smithsonian's Natural History Museum is to Washington and its tourists. The director of the California Academy, Robert C. Miller, who is also its curator of invertebrate zoology, is well acquainted with Past President Waldo L. Schmitt of the Washington Academy, who until he retired was head curator of biology in the U. S. National Museum and is a marine invertebrate zoologist.

Dr. Schmitt, Archibald T. McPherson, and other members of the Policy and Planning Committee, together with President Abelson, have been desirous of applying to the improvement of the Washington Academy whatever might be pertinent and useful in the organization and programs of the California Academy and of other academies of sciences. Accordingly, when Dr. Schmitt heard that Dr. Miller was coming to Washington on other business, he invited him to talk about the California Academy at the February 21 meeting of the Board of Managers. Dr. Miller accepted the invitation and brought with him printed information about the California Academy, from which much of this staff report has been written.

The California Academy of Sciences is a large and successful civic enterprise, a fruitful association between scientists and the interested lay public. It is operated both for the advancement of science (chiefly natural history) through research and for the education of the public through exhibits, demonstrations, lectures in natural history, astronomy, etc. Its scientific work covers the world; its educational work the local population, resident and transient, and those elsewhere who are reached by its television program, "Science in Action."

The California Academy of Sciences was founded in 1853 when San Francisco was being fertilized by California gold. In those days, science and natural history were synonomous except in the older scientific centers of the world where natural

philosophy embraced all science. The Academy began with a "cabinet of specimens" and has never deviated from its original objectives, to collect specimens of plants, animals, minerals, etc., to study and describe them in scientific publications, and to exhibit the more interesting specimens to the public.

The Academy's building and collections were ruined by the earthquake and fire of 1906. Thus the Academy lost its downtown location and was permitted to rebuild on a much more attractive site in Golden Gate Park where its buildings are now situated. To North American Hall, completed in 1916, was added the Steinhart Aquarium in 1923, the Simson African Hall in 1931, the Hall of Science in 1951, the Alexander F. Morrison Planetarium in 1952, and the Alice Eastwood Hall of Botany and the Mailliard Library in 1959, all valued at more than $5,000,000. In the United States, only the California Academy has a contiguous natural history museum, aquarium, and planetarium.

In fiscal year 1960, membership dues constituted only 3.65 percent of the total funds, $611,000, provided for the year. About 36 percent came from grants and gifts, 33 percent came from the City of San Francisco, 23 percent was "profit" from various enterprises of the Academy, and the remainder, an amount greater than dues, was called "miscellaneous." But $709,000 was expended during the year, making it necessary to solicit donations from business organizations, foundations, and others from whom $59,000 was collected toward reduction of the operating deficit. These figures indicate that the California Academy was spending in 1960 about 60 times as much as the Washington Academy, exclusive of the Joint Board. Nevertheless, Dr. Miller is not satisfied with his Academy's financial condition. The Board of Trustees is trying to get a larger appropriation from the City of San Francisco, to increase the number of dues-paying members, and to obtain annual support from industry and foundations for curatorial activities. Dr. Miller wrote, "The Academy's greatest need today is for a substantial endowment . . ." to support research.

There are 13 categories of membership, one to fit every purse. The total membership as of June 30, 1960 was 2,317, including 110 business and foundation donors. The record does not show what was paid by each category. Professional scientists are found among the 214 fellows of the Academy and to a lesser extent among the 1,274 regular members.

Until recently the Academy had a Board of Trustees composed of prominent, interested citizens and a Council composed of scientists. Now the Board and Council are combined into a single Board of Trustees of 27 members.

The Academy has a staff of professional curators in the following subjects: aquatic biology, astronomy, botany, entomology, geology, herpetology, ichthyology, invertebrate zoology, and ornithology and mammalogy. The curator of aquatic biology is also curator of the Steinhart Aquarium and program host for the TV series, "Science in Action." The curator of astronomy is also manager of the Morrison Planetarium. There is also a curator of exhibits. Nearly all curators have professional assistants. As of July 1, 1960, Joel F. Gustafson became associate director to relieve Dr. Miller of some of his administrative burdens.

The Department of Entomology is one of the largest in the Academy. It has some 2,500,000 mounted and labeled specimens and more than a million awaiting attention. The Academy received $90,000 from the National Science Foundation to pay for arrangement and improvement of the collection over a three-year period; also a grant of $18,000 to the curator for a three-year study of the order Embioptera. The curator of geology received a similar grant to study fossil diatoms in certain marine sediments and to train a graduate student in such investigations.

The work of the professional staff re-

sults in scientific papers that appear in appropriate journals or in the *Proceedings, Occasional Papers,* or *Memoirs* of the Academy. Their expeditions may yield popular articles, as the recent story of the African trip of Edward S. Ross for the collection of insects (Hunting Africa's Smallest Game, *National Geographic Magazine 119,* 406-419 (1961). The Academy has an editor of scientific publications.

Turning to the activities of the Academy in public education, we find 2,600,000 people visiting the Academy in 1960 to see the exhibits, including the aquarium (free) and the planetarium (small charge for admission). The aquarium is maintained by appropriations from the City of San Francisco, which will pay for renovations now badly needed. Dr. Miller is proud of the fact that the planetarium star-projector, a very complicated optical device, was made in the instrument shop of the Academy at a time when it was impossible to obtain a Zeiss instrument. This shop became so proficient in optical work prior to World War II that it was able to accept contracts for the production of instruments for the Armed Forces.

From the information at hand it is not clear what meetings are held at the Academy. There is, we read, a public relations man on the staff who issues a monthly newsletter, which "describes current developments within the Academy, announces meeting schedules. . . ." etc. And in another place we read that "the Hall of Botany [now completed] will contain a commodious, well-appointed room for meetings of the Botany Club and other special gatherings . . ."

The Student Section of the Academy brought to it in 1960 "some 80 Bay area junior and senior high school students" who work after school and on Saturdays and holidays on their own projects under the direction of trained supervisors. The Academy is also host to an annual Bay Area Science Fair. Last year 350 exhibits were shown to 88,000 visitors.

The Academy reaches the public outside of its own domain in various ways. The television program, previously mentioned, has a commercial sponsor, makes some money for the Academy, and reaches more than 600,000 people. It has received an extraordinary number of local and national awards, citations, and honors. An artistic, well-illustrated popular magazine called *Pacific Discovery* is published by the Academy six times a year. Subtitled a "Journal of Nature and Man in the Pacific World," it can now be obtained on many newsstands. The curators and their assistants answer many questions by correspondence and appear as guest speakers before many different organizations.

THE ANNUAL DINNER OF JANUARY 19

Because of history-making weather and traffic conditions on the night of January 19, only about a third of those registered for the Academy's annual dinner were able to attend. The deficit in the annual budget is too large to consider refunding all payments made in advance, and some members have definitely stated that they desire no refunds. The matter has therefore been placed on a voluntary basis. Non-attendants who have already paid may write the treasurer for partial or full refunds as they wish; and voluntary contributions of from one to four dollars will be gladly accepted from registrants who have not yet paid but wish to do so.

Communications may be sent to Norman F. Braaten, treasurer of WAS, in care of the Academy offices at 1530 P St., N.W.

APRIL MEETING

(458th Meeting of the Washington Academy of Sciences)

SPEAKER

Francis J. Heyden, S.J., Director
Georgetown University Observatory

SUBJECT

Astronomy Looks to Its Future

DATE

Thursday, April 20, 1961, 8:15 p.m.

PLACE

John Wesley Powell Auditorium, Cosmos Club, 2170 Florida Ave., N.W.

Francis J. Heyden, S.J., was born in Buffalo, N. Y. He received the A.B. degree from Woodstock College, and the M.A. and Ph.D. degrees in astronomy from Harvard University. Following early work as chief astronomer of the Manila Observatory and as a Harvard fellow, he came to Georgetown University in 1945, and has been director of the Georgetown Observatory since 1948. He has participated in a number of solar eclipse expeditions.

1961 BUDGET APPROVED

The following budget for 1961 was approved at the Board of Managers meeting on February 21. (The itemization also includes a $50 increase that was approved at the Board meeting of March 7.)

Anticipated income for 1961 is $12,070, including $5,300 from dues. Any deficit will be met by withdrawals from reserve funds.

Journal	$ 7,300[1]
Secretary	1,500
Treasurer	170
Meetings Committee	1,200
Committee on Encouragement of Science Talent	250
Other committees	100
Directory reserve	1,000
Annual dinner and miscellaneous	400
AAAS (Academy conference)	20
Science Calendar	75
Joint Board on Science Education	500
Subtotal	$12,515
Central office, through March 31	1,425
Total	$13,940

[1] Includes $1,600 for 1960 bills paid in 1961.

Science in Washington

SCIENTISTS IN THE NEWS

This column presents brief items concerning the activities of members of the Academy. Such items may include notices of talks given, important conferences or visits, promotions, awards, election to membership or office in scientific and technical societies, appointment to technical committees, civic activities, and marriages, births, and other family news. Formal contributors have been assigned for the systematic collection of news at institutions employing considerable numbers of Academy members (see list on masthead). However, for the bulk of the membership, we must rely on individuals to send us news concerning themselves and their friends. Contributions may be addressed to Harold T. Cook, Associate Editor, care of Agricultural Marketing Service, U. S. Department of Agriculture, Rm. 3917 South Bldg., Washington 25, D. C.

APPLIED PHYSICS LABORATORY

On January 18, **Ralph E. Gibson** addressed Naval Reserve Ordnance Company 5-9 on "The Applied Physics Laboratory—Its Program and Products."

Dr. Gibson was one of three participants in a recent R&D roundtable discussion sponsored by the American Society for Public Administration, the Society for the Advancement of Management, and the Armed Forces Management Association. His topic was, "The Role of Management in R&D Manpower Utilization."

Albert M. Stone, technical assistant to the director, participated in the Strategy for Peace Conference at Arden House, Harriman, N. Y., on January 12-14. On December 15 he spoke on "Plasma Dynamics Research" before Naval Ordnance Reserve Company 5-12.

Alfred J. Zmuda has been promoted to the principal staff of APL.

COAST AND GEODETIC SURVEY

As part of a move involving several units of the Survey, **Norman F. Braaten** and **David G. Knapp** have relocated on the fifth floor of the Longfellow Building, Rhode Island Avenue at Connecticut. The move includes the Leveling Branch and the Geomagnetism Branch, including the IGY World Data Center A for Geomagnetism, Seismology, and Gravity.

L. G. Simmons and **Charles A. Whitten** attended a symposium February 6-8 on "Geodesy in the Space Age." Mr. Simmons presented a paper, "Highly Accurate Geodimeter Triangulation in the Cape Canaveral Area," and Mr. Whitten was a moderator for a Panel on Education in Geodetic Sciences. The symposium was held at the Division of Geodetic Science of Ohio State University, Columbus.

Donald A. Rice attended a meeting of the Geophysics Panel, Scientific Advisory Board, USAF, held at Patrick AFB, Fla., on February 21-23.

GEOLOGICAL SURVEY

T. P. Thayer returned in January from Europe, after attending the International Geological Congress and examining chromite deposits in the region between Yugoslavia and Pakistan. In Yugoslavia he spent two weeks in the field under the auspices of ICA and the Yugoslavia Geological Institute. Dr. Thayer also attended a symposium on chromite sponsored by the CENTO powers, which included visits to some of the principal chromite districts in Turkey, Iran, and Pakistan.

Dorothy Carroll is giving a course in pedology at American University during the spring semester.

GEORGE WASHINGTON UNIVERSITY

Mary Louise Robbins, Department of Bacteriology, attended a symposium on the molecular basis of neoplasms at Anderson Memorial Hospital, Houston, Tex., in the week of February 20.

B. D. VanEvera, president-elect of the Academy, represented WAS President Abelson on the occasion of the recent Engineers and Scientists Day.

HARRIS RESEARCH LABORATORIES

Milton Harris spoke before the Joint Meeting of the American Chemical Society and the American Institute of Chemists at the Hotel New Yorker on February 10. The title of his talk was, "Is the Chemist Ready for the Scientific Explosion?" Dr. Harris also gave talks on this subject before the Western Chapter of the American Institute of Chemists in Los Angeles on January 26, and before the Twin Cities Chapter in St. Paul on January 31.

Dr. Harris also spoke before the Piedmont (Ga.), Birmingham (Ala.) and New Orleans chapters of the American Institute of Chemists on March 7, 8 and 9, respectively. He discussed problems dealing with the chemist and his role in an expanding economy and the insecure world.

Alfred E. Brown has been appointed chairman of the new Science Committee of the Board of Trade. The Science Committee will establish and supervise the program of the recently-formed Metropolitan Washington Science Bureau.

Dr. Brown has been appointed a member of the American Association for the Advancement of Science Council Study Committee on Administration of Scientific Work. He also has been elected a member of the Executive Committee of the Science Manpower Commission.

Edmund M. Buras, Jr., discussed "Soviet Artificial and Synthetic Fibers" at a dinner meeting of the Washington Section, American Association of Textile Chemists & Colorists, on March 17. Mr. Buras told what fibers are produced by the Soviet industry, how they compare with those used in the United States, and what new developments could be expected in both consumer items and high-performance textiles as a result of Soviet research efforts.

NATIONAL BUREAU OF STANDARDS

Academy members presenting papers at recent meetings have included the following:

Alexander, S. N.: "NBS Experience with a Man-Machine Research Facility"—Office of Naval Research and University of Michigan jointly sponsoring a conference on "The Utilization of Research in Statistical Theory," University of Florida, Gainesville, February 1; **Bates, R. G.:** "Recent Developments in pH Measurements"—Instrument Society of America, Charleston (W. Va.) Section, January 9; **Broida, H. P.:** "Spectroscopy of Condensed Non-Polar Gases (Van der Waals Solids)"—University of Washington Physics Department, Seattle, January 10; **Eisenhart, C.:** "Precision and Accuracy—Experiment Design Aspects"—American Society for Quality Control, Metropolitan Section, South Orange, N. J., February 4; **Herzfeld, C. M.:** "Philosophies of Science"—All Souls Unitarian Church, Washington, February 7; **Kushner, L. H.:** "The Structure of Metals"—Joint Board on Science Education, Pomonkey (Md.) High School, January 25; and "Dislocation in Crystals"—Joint Board on Science Education, Anacostia (D. C.) High School, February 6; **Madorsky, S. L.:** "Impressions of a Recent Trip to Russia"—Naval Reserve Ordnance Company 5-10, Dahlgren, Va., January 16, and "Impressions of a Trip to Russia"—American University Park Citizens Association, Washington, February 6; **Paffenbarger, G. C.:** "Some Clinical Applications of Research Findings in Dental Materials"—American Academy of Restorative Dentistry, Chicago, February 5, "Recent Advances in the Field of Dental Materials"—Chicago Dental Society, February 5-8, and "Clinical Research and the Dentist"—Association of Dental Alumni of Columbia University, New York City, February 10; **Page, C. H.:** "Bridges, Trees, Polyhedra, and Electric Circuits"—Mathematics and Science Club, Wheaton (Md.) High School, January 9; **Posner, A. S.:** "The Crystal Chemistry of Dental Tissues"—Pathodontia Section of the First District Dental Society of New York, New York City, January 9, and "The Biological Applications of X-Ray Diffraction"—Columbia University, College of Physicians and Surgeons, New York City, February 2; **Rhodes, Ida:** "Mechanical Translation"—University of Pennsylvania, Philadelphia, February 1; **Taylor, J. K.:** "Chemistry—Profession or Skill?" Akron Section, American Chemical Society, January 19; **Townsend, J. R.:** "Standardization in United States—Its History and Development"—Middle East Standardizaiton Symposium, Cairo, Egypt, between January 30 and February 6; **Youden, W. J.:** "Elementary Statistical Design"—Society of Plastics Engineers, Washington, January 25, and "Systematic Errors in Physical Constants"—Advanced Seminars on Experimental Designs—held by the U. S. Army at the University of Wisconsin, Madison, January 10.

S. N. Alexander participated on a panel discussion of Computer Installations, Sampling Techniques, Input Equipment, Time Sharing, Programming, held by the Advisory Committee on Computers in Research of the National Institutes of Health on February 9.

NATIONAL INSTITUTES OF HEALTH

Wade H. Marshall, chief of the Laboratory of Neurophysiology, NIMH-NINDB, has been made a foreign member of the Brazilian Academy of Sciences, in recognition of his valuable contribution to science and helpful collaboration with Brazilian research workers. Dr. Marshall spent some time in 1958 as a guest worker and in 1959 as a consultant at the Instituto de Biofisica, Universidade do Brazil.

USDA, WASHINGTON

Justus C. Ward has been elected to chairmanship of the Interdepartmental Committee on Pest Control. He discussed pesticide problems before the California Extension Service Conference, Asilomar, Calif., on January 18.

Ashley B. Gurney, Entomology Research Division, spent the period February 9-19 in Puerto Rico, collecting insects in company with Aaron M. Nadler of New York City. Though the dry season is traditionally poor for collecting, many interesting species were secured in the Mariacao Forest Reserve and in the vicinity of El Yunque. One order not previously known from Puerto Rico, the Zoraptera, was obtained.

Edson J. Hambleton, assistant to the director, In-charge Foreign Technical Programs, Plant Pest Control Division, ARS, attended the annual conference of personnel attached to the Regional Insect Control Project working in the Near East and Africa at Beirut, Lebanon, January 9-13. From January 16-21 he served as a U. S. delegate to the ninth session of the FAO Technical Advisory Committee on Desert Locust Control, Rome, Italy. Following the Rome meeting, Mr.

Hambleton visited the RICP post at Tripoli, Libya, before participating in the first African Pest Control Seminar held in Tunis, Tunisia, from January 25 to February 3. This Seminar was organized and conducted by personnel of the Regional Insect Control Project in cooperation with the International Cooperation Administration and the U. S. Operations Mission to Tunisia. Seven African countries participated. The purpose of the Seminar was to stimulate the development of more effective control organizations and better international cooperation in pest control. Papers presented concerned role of government and farmer in pest control, organization of pest control, quarantine services, insect survey, use of aircraft, and modern techniques. Panel discussions were held on locust control, pests of citrus, cotton, fruits and vegetables, and stored products.

RETIREMENTS

The following Academy members retired in 1960: Allan M. Bateman, Edwin H. Behrend, Doris H. Blake, Curtis P. Clausen, E. A. Eckhardt, James Gilluly, Oliver H. Gish, Eleanor B. Knoff, Walter B. Lang, Atherton H. Mears, Harold Morrison, and L. W. Parr.

DEATHS

Arthur T. Pienkowsky died December 31 in Chicago, where he had been living since 1953. He was 87 years old. He was graduated from the University of Chicago in 1898 and taught in Indiana and Illinois high schools from then until 1903. He was appointed laboratory assistant in the Bureau of Standards in 1904, and was a physicist when he retired in 1944. Following retirement, he served as consultant to the Torsion Balance Company.

AFFILIATED SOCIETIES

Where information as to the specific program scheduled for meetings of Affiliated Societies was not available sufficiently in advance to have been included in the Calendar of Events for the March issue of the Journal, *it is carried below as a news item. Additional items considered of general interest are noted at appropriate points.*

Acoustical Society of America, Washington Chapter

The March meeting date was shifted from the 3rd to the 2nd Monday, at which time the members heard Robert W. Young, U.S. Navy Electronics Laboratory, speak on "Piano Tunings and Intonation of Various Wind Instruments." This event took place in the Exhibit Room, Industrial Building, NBS.

The Society is currently engaged in polling its membership with a view to selecting the most favorable meeting time and place. It is perhaps a commentary on the current Washington scene that they report "requests to meet in almost every building of adequate size in the Metropolitan Area and on all nights," with a desire for "plenty of parking."

American Institute of Electrical Engineers, Washington Section

The Division of Instrumentation and Telemetry held its discussion on March 13, rather than March 6, as first announced, and added to the program a second paper on "Rocket Propulsion Measurements."

American Society of Civil Engineers, National Capital Section

At a luncheon meeting on February 28, William E. Finley, National Capital Planning Commission, spoke on "Metro—2,000 A.D.," an estimate as to what our cities will be like in another several decades.

As a special feature of the annual dinner meeting, Ivan A. Nestigen, HEW, discussed programs of his Department, with particular attention to water pollution control, hospital and school construction, and atmospheric pollution.

A special committee of the Section has recommended the names of Waldo E. Smith and W. O. Hiltabidle, both past presidents, for consideration as nominees for national director, District 5. Members will ballot shortly.

A number of local sections of national engineering societies are working toward the development of a United Engineering Center, comparable in some ways to the new ACS building here in Washington, in support of which members of the various engineering groups are urged to contribute.

American Society of Mechanical Engineers, Washington Section

The sixth annual Gas Turbine Conference and Products Exhibit, a joint effort of the Gas Turbine Power Division of ASME and the Department of Defense, was held at the Shoreham Hotel, March 5-9. A wide spectrum of technical papers and exhibits, covering recent progress in gas turbines for aircraft, automotive, and marine situations, was available.

Botanical Society of Washington

On March 7, L. B. Smith spoke to the Society on the research and service activities of the Department of Botany of the Smithsonian. A tour of the laboratories of the Division of Radiation and Organisms was arranged by William Klein.

Chemical Society of Washington

At a Board of Managers meeting on February 23, an *ad hoc* Committee on Topical Groups was

established to implement the formation of topical groups within the Society. The Special Committee on Employment outlined its plans to establish a file of persons seeking employment, and of employers having jobs to be filled. The Board endorsed a proposed code of professional conduct, scheduled for consideration on March 26 by the national Council of the American Chemical Society.

At the Society's annual Hillebrand Award Dinner on March 9, Frank T. McClure of the Applied Physics Laboratory received the Hillebrand Prize for 1960 for his contributions to a knowledge of solid propellant combustion. Dr. McClure then addressed the Society on the subject, "Rockets, Resonance, and Physical Chemistry."

Entomological Society of Washington

Our contact reports that Reece I. Sailer is now established in the European Parasite Laboratory, Seine, France, where he is investigating insects that may be introduced into the United States as agents of biological control. Ashley B. Gurney visited Puerto Rico during February and reported on his collecting activities at the March meeting of the Society.

Geological Society of Washington

M. F. Kane spoke on "Relationship between Isostasy and Geologic Structure in Clark County, Nevada," Augusto Gansser on "Salt-domes and Mud-volcanoes," and D. M. Pinckney on "Veins and Hydrothermal Alteration in the Boulder Batholith, Montana" at the March 8 meeting. Two weeks later, D. B. Krinsley, USGS, dealt with "Limnological Investigations at Centrum Lake, N.E. Greenland," Roland Brinkman, of the University of Bonn, with "Deformation of Fossils and Rocks," and Edwin Roedder, USGS, with "Depression of the Freezing Point in Fluid Inclusions."

Helminthological Society of Washington

A varied program was available to the Society at its March 15 meeting at NIH, in Bethesda, including papers on the parasitic nematode *Nippostrongylus* and on helminthology in Australia (R. I. Sommerville, Sydney), on *Trichinella* (L. J. Olivier, NIH), on *Trypanosoma* (W. F. Cantrell, NIH), on cultivation of *Entamoeba* (L. S. Diamond, NIH), and on schistosomiasis in India.

Insecticide Society of Washington

"The Foreign Quarantine Entomology Program of the Public Health Service," by John H. Hughes, PHS, and "New Problems in Disinsectization of Modern Aircraft," by R. A. Fulton, USDA, constituted the March 15 program of the Society.

We are informed that Martin Jacobson, USDA, has been given a $300 award for his outstanding work on the gypsy moth sex lure, and that Sam Gertler has retired from the Pesticide Chemicals Research Branch, USDA, after 36 years of service, receiving a letter of commendation from Secretary Benson. William E. Bickley, University of Maryland, has been elected president of the American Mosquito Control Association.

Institute of Radio Engineers, Washington Section

One of the more comprehensive and informative bulletins distributed by societies affiliated with the Washington Academy is that of the IRE. Much of its March issue honors four new Section Fellows: Robert J. Adams, Richard F. J. Filipowsky, Delmer C. Ports, and Gustave Shapiro.

The Section boasts an impressive array of no less than 17 professional group chapters, some of which from time to time sponsor the regular sectional meetings or hold sessions of their own. In March alone, there were four such events: on March 8, the group on Component Parts heard a discussion of "Solid State Ceramic Devices"; on March 14, the group on Microwave Theory and Technics dealt with "Microwave Components for the 1.5-3 Millimeter Wave Region"; on March 16, the group on Bio-Medical Electronics considered "Automatic Monitoring of Airborne Biological Products"; and on March 23, the group on Antennas and propagation took up "Television Transmitting Antennas."

The Second National Symposium on Human Factors in Electronics, noted in the March *Journal*, plans to treat man-computer relationships, human factors in air traffic systems, in ship navigation and communication, and information and communication in electronic system maintenance.

An editorial on the final page of the Section bulletin reports concern on the part of engineers as a group, voiced by A. H. Flax of Brooklyn Polytech, that loose usage of the terms "scientist" and "engineer" has been responsible for a loss of stature by the latter in the public mind, and a decline in engineering college enrollments.

L. V. Berkner, national president of IRE, was the principal speaker at the annual dinner meeting of the Washington Chapter on February 11. He spoke on "Meeting the Challenge of the Space Age—Professional Development through the Institute of Radio Engineers."

Medical Society of the District of Columbia

If we may judge by the bulletin "Current Medical Events," scarcely a day goes by without some event of interest to the medical personnel of the city—26 are noted for March, as many as five on a single day.

Society for Experimental Biology and Medicine, District of Columbia Section

No meetings of the Section are to be held in April or May; the annual dinner is currently scheduled for June 1.

CALENDAR OF EVENTS

Events which will take place, so far as we can determine at the time of writing, subsequent to the appearance of the Journal *are noted below. Where possible, the nature of the program is indicated; in many instances the entry merely notes date and place of a regularly scheduled meeting of the organization named. Last minute changes in time and place, or emergency cancellations, may in certain instances alter the situation.*

April 4—Botanical Society of Washington

The Society plans a special, early-evening trip to the National Arboretum in place of its regular formal sessions. Detailed schedule will be sent to members prior to that time.

April 5—Washington Society of Engineers

John Wesley Powell Auditorium, 8:00 p.m.

April 6—Entomological Society of Washington

Room 43, U. S. National Museum.

April 10—American Society for Metals, Washington Chapter

Silver Certificate Night; nine members, including five members of the Washington Academy of Sciences, will be honored for 25 years' membership in the Society. P. C. Rossin, Universal-Cyclops Steel Co., speaks on "Infab Inert Atmosphere Fabrication Facility."

AAUW building, 2401 Virginia Avenue, N.W., 8:00 p.m.

April 10—Institute of Radio Engineers, Washington Section

Regular section meeting, sponsored by the Professional Group on Electron Devices.

April 11—American Institute of Electrical Engineers, Washington Section

PEPCO Auditorium, 8:00 p.m.

April 11—American Society of Civil Engineers, National Capital Section

John Wesley Powell Auditorium, 8:00 p.m.

April 11—Institute of Radio Engineers, Washington Section

Meeting of Professional Group on Microwave Theory and Technics.

April 12—Geological Society of Washington

John Wesley Powell Auditorium, 8:00 p.m.

April 13—American Society of Mechanical Engineers, Washington Section

Meeting in area of Division of Applied Mechanics.

PEPCO Auditorium, 8:00 p.m.

April 13—Chemical Society of Washington

Linus Pauling will speak on "The Structure of Electron Deficient Substances."

John Wesley Powell Auditorium, 8:15 p.m.

April 14—Philosophical Society of Washington

John Wesley Powell Auditorium, 8:15 p.m.

April 17—Acoustical Society of America, Washington D.C. Chapter

April 17—Society of American Military Engineers, Washington Post

YWCA, 17th and K N.W., 12:00 noon.

April 18—Anthropological Society of Washington

William Caudill, NIH, will speak on "Anthropology and Psychoanalysis: Some Theoretical Issues."

Room 43, U.S. National Museum, 8:15 p.m.

April 18—Institute of Radio Engineers, Washington Section

Meeting of Professional Group on Antennas and Propagation for its regular lecture.

April 19—Insecticide Society of Washington

Symons Hall, University of Maryland, 8:00 p.m.

April 19—Washington Society of Engineers

John Wesley Powell Auditorium, 8:00 p.m.

APRIL 20—WASHINGTON ACADEMY OF SCIENCES

April 25—American Society of Civil Engineers, National Capital Section

Luncheon meeting at YWCA, 12:00 noon.

April 25—Society of American Bacteriologists, Washington Branch

Sternberg Auditorium, Walter Reed Army Medical Center, 8:00 p.m.

April 26—Geological Society of Washington

John Wesley Powell Auditorium, 8:00 p.m.

April 27—American Society of Mechanical Engineers, Washington Section

Meeting in division of metals engineering. L. M. Kushner will speak on "Imperfections and Mechanical Properties," and H. E. Frankel on "Down to Earth Space Problems."

PEPCO Auditorium, 8:00 p.m.

April 28—Philosophical Society of Washington

John Wesley Powell Auditorium, 8:15 p.m.

THE BROWNSTONE TOWER

Progress in science takes place primarily in the minds of individuals. To stimulate fruitful solitary thinking, communication of various kinds among scientists is necessary. Since World War II I have been engaged in assisting scientists to communicate among themselves. As executive secretary of the Division of Biology and Agriculture, National Academy of Sciences—National Research Council, I am concerned principally with communications in the field of scientific strategy, or policy, usually through meetings of committees, conferences, or symposia.

You will be interested, I think, in the recent annual meeting of the members of the National Research Council, on March 9-11. It is an example of an unusually stimulating interdisciplinary conference in Washington. Limited in attendance and not covered by the press, this annual meeting is not as well known to the local scientific community as is the annual spring meeting of the National Academy of Sciences.

The National Research Council, as the name implies, is in part a council of more than 275 members who represent the national scientific societies of the United States or the scientific organizations within the Federal Government's departments. Some, called members at large, have no liaison responsibilities, and all, as experienced scientists, are expected to speak their own minds on questions of policy. The National Research Council is also the operating arm of the National Academy of Sciences, and as such enlists the services of thousands of scientists and technologists who serve without financial compensation on NAS-NRC committees. The members (council) of the National Research Council have the opportunity, particularly at annual meetings, to influence the scope and character of the committee activities of NAS-NRC.

Prior to 1958 the members of the National Research Council had never met in plenary session; instead, each of the eight substantive divisions of the Council held its own annual meeting, which was attended by the members affiliated with it. It seemed that there might be a better way to exchange ideas among the officers, members, and staff of the Council, and in 1958 the members met for the first time as a single body in a three-day conference, within which an afternoon and evening were devoted to simultaneous, separate meetings and dinners of the eight divisions. This plan worked so well that it became the pattern, with slight modifications, for the subsequent annual meetings.

With the above background in mind you will be able, I hope, to understand the nature of the recent conference. It was attended by about 200 members of the National Research Council from all parts of the United States. The density of geographical distribution of members is not uniform, but is inversely related to distance from Washington, probably for reasons of economy and convenience of access to NAS-NRC. Many representatives of societies live in the Washington area, and nearly all the Government liaison members live here. Consequently a number of members of the Washington Academy are also members of the National Research Council; for example, Past President A. T. McPherson represents the National Bureau of Standards, and Past President Waldo L. Schmitt represents the Society of Systematic Zoology. Associate Editor Russell B. Stevens represents the American Phytopathological Society, and Robert W. Krauss, the subject of my previous Brownstone Tower, represents the American Society of Plant Physiologists. A few of the members of the National Research Council are also members of the National Academy of Sciences, and Detlev W. Bronk, president of the Rockefeller Institute, is the head of both the Council and the Academy.

The recent Annual Meeting of the National Research Council opened at noon on March 9 with a luncheon served by a caterer on rows of tables covering the floor of the Great Hall, or rotunda, of the Academy building on Constitution Ave. Because a member of the National Research Council serves at least three years, and often by reappointment for longer periods, I saw many familiar faces at the tables and began then the pleasant duty of meeting all of the 47 members of my division who were present, including five new members.

After lunch all the members gathered in the Lecture Room to hear the opening address by President Bronk, who never fails to hold his audience in admiring attention. Then followed two illustrated talks on instrumentation and scientific significance of meteorological satellites; the first by William G. Stroud of NASA, and the second by Harry Wexler of the Weather Bureau. The latter is a member of the Washington Academy and a recent recipient of one of the National Civil Service League's Annual Career Civil Service Awards.

The purpose of this and other reports at the plenary sessions was to acquaint the mem-

bers of the Council with the current status of complex scientific and engineering projects that are in some way of interest to everyone. Thus the members are lifted out of their usual sphere of interests and are given a new and exciting perspective.

After a reception and buffet dinner in the Great Hall, the members returned to the Lecture Room and heard J. B. Wiesner, Assistant to the President for Science and Technology, talk about his responsibilities as an adviser to President Kennedy and as chairman of the President's Science Advisory Committee. The evening ended with an illustrated talk by Harry Hess on the Mohole, with an up-to-the-minute report of success in the first attempt to drill into the bottom of the deep ocean. This of course is preliminary to a later attempt to drill through the crust of the earth to the mantle.

On the morning of March 10 each member was free to attend one of three simultaneous meetings in accordance with his preference. The titles were (1) The Role of Mathematics in Other Sciences, (2) What Should the Public Understand about Science? and (3) Problems Created by the Rapid Growth of Science. Distinguished scientists were selected as chairmen of these meetings (J. B. Rosser, Paul Weiss, and Saunders MacLane, respectively) and interested, articulate persons were asked in advance to prime the discussions. Thus all members were encouraged to express themselves on one or another of these topics.

In the afternoon eight separate division meetings were held. It was my duty to attend the one in Biology and Agriculture, in which, for the first time, a small symposium was featured, on the undesirable side effects of pest control in agriculture, forestry, public health, and wildlife management. The intention of the International Union of Biological Sciences to develop an International Biological Program also was discussed. It is to be a planned program requiring international collaboration over a period of years on biological projects that cannot be efficiently advanced in any other way.

In the evening our trend toward scientific integration was continued by the holding of a joint dinner of the Divisions of Biology and Agriculture and Chemistry and Chemical Technology. Dr. Bronk attended our dinner. The after-dinner speaker was Farrington Daniels, vice president of the National Academy of Sciences, who talked on his experiences in India, Southeast Asia, and South America on missions of good will for the Academy. How, he asked himself, can native science and technology be developed in these countries so as to make possible a standard of living for their peoples approaching that which we now enjoy? Again our members were stimulated to think about science as a world-wide activity requiring international cooperation.

On Saturday morning, March 11, the members assembled in the Lecture Room to hear the chairman of each of the eight divisions talk briefly about the principal activities and plans of his division; also to hear the chairman of each of the Friday morning sessions characterize the discussion at his meeting. At one point during the morning, Alan T. Waterman, director of the National Science Foundation, talked on the relationships between NAS-NRC and NSF. Dr. Bronk opened the Saturday morning session and presided throughout, giving the audience interesting information and comment on the subjects being discussed. The meeting was remarkable for its great diversity, its important ideas, its good humor, and its brilliance. I wish all members of the Washington Academy could have enjoyed it and profited by it.

—Frank L. Campbell

ACADEMY ACTIVITIES

FEBRUARY BOARD MEETING

The Board of Managers held its 535th meeting on February 21 at the National Academy of Sciences, with President Abelson presiding.

The minutes of the 534th meeting were approved. Dr. Specht indicated that Dr. Seeger's report of the Committee on Science Education, presented at that meeting, had been inadvertently omitted but would be added to the permanent minutes.

Committee appointments for 1961 were announced. (See March *Journal*, pages 34-35.)

For the Policy and Planning Committee, Dr. Campbell presented a report containing the following recommendations, which were adopted by the Board after considerable discussion:

(1) An effort should be made to build up membership in the Academy before it is recommended that dues be increased. The definition of "scientific attainment" should be broadened to include the attainment of leadership in the societies affiliated with the Academy, as evidenced by election to office, particularly to the presidency of such societies.

(2) It should be suggested to affiliated societies that they be represented on the Board of Managers by their president, president-elect, or past president.

(3) Before it is recommended that dues be increased, the *Journal* of the Academy should be improved. To give the *Journal* greater support under a balanced budget, the cost of central office services should be reduced or eliminated. Specifically, the Academy's full-time employee

should be released as of March 31, and a volunteer executive secretary should be appointed, to serve if possible without paid assistance.

(4) The Board of Managers should meet on the first Tuesday of each month in which the Academy meets, instead of on the third Tuesday.

The budget for 1961 was adopted in the amount of $13,890, this figure including $1,425 for operation of the central office through March 31. (See details elsewhere in this issue.)

Dr. Frenkiel discussed plans of the Meetings Committee for the coming year. He indicated that it was hoped to emphasize presentations with general society interests, and to consider controversial subjects and such interdisciplinary discussions as would arise over overlapping areas of interest in science. The use of discussion panels will be explored. Further, special meetings may be held in addition to the regularly scheduled meetings.

Dr. Abelson, speaking for Dr. Robbins of the Membership Committee, reported on plans to increase the membership during the current year by as many as three to four hundred individuals, to offset the disadvantages under which the Academy is now operating.

The Secretary presented for First Reading the names of 18 candidates for membership.

The Board approved the awarding of certificates of merit, at the Academy meeting of March 16, to 21 high school students of the Metropolitan Area, for their achievements as winners or runners-up in the 1960 National Science Talent Search (see March issue, page 36).

Following the second reading of their names, the following persons were elected to membership in the Academy: Calvin Golumbic, Reino W. Hakala, Ralph Klein, Herbert L. Ley, Jr., Joseph B. Morris, Austin C. Polins, Preston T. Talbert, George C. Turrell, and Elizabeth G. Frame.

Reporting on the *Journal* Mr. Detwiler announced that Lawrence A. Wood had agreed to serve as one of the associate editors. The Board approved the appointment.

Speaking for himself and the treasurer, Dr. Specht indicated that in future, requests for resignation by members in good standing would be acted upon without referral to the Board.

Dr. Abelson then presented the guest of the evening, Robert C. Miller, director of the California Academy of Sciences, who informally discussed the history, organization, and activities of this group.

MARCH BOARD MEETING

The Board of Managers held its 536th meeting on March 7 at the National Academy of Sciences, with President Abelson presiding. The minutes of the 535th meeting were approved with corrections.

On recommendation of the Executive Committee, the budget of the Committee on Encouragement of Science Talent was increased by $50, to a total of $250.

Dr. Frenkiel discussed the forthcoming general meeting on March 16, at which members of the Junior Academy would be honored; he indicated that following the formal lectures by the speakers of the evening, various physicists and biologists would be asked to join in an informal discussion.

For the Membership Committee, Dr. Robbins presented for first reading the names of three candidates for membership.

Dr. Robbins indicated that steps were being taken to establish a new Membership Committee Panel on Engineers; also, that the Mathematics Panel would be expected to process nominations of teachers through the recommendation of Keith Johnson, who will be made an additional member of the Panel. A discussion of proposed changes in the membership nomination form was carried over to the next Board meeting.

At the request of Dr. McPherson of the Committee on Grants-in-Aid, the Board approved an award of $109 to Michael Souders for a research project.

The Board approved a recommendation by Dr. Campbell of the Policy and Planning Committee, to the effect that the retiring president of the Academy should be a member of the Board in the year following his presidency. The matter will be brought to the membership for approval at election time.

Dr. Brenner described plans of the Committee on Encouragement of Science Talent for the dinner and certificate presentations at the March 16 meeting, and asked for volunteers to help sponsor the dinner.

Dr. Taylor presented a report on operations of the Joint Board on Science Education, arising out of the current grant from the National Science Foundation. Dr. Taylor was complimented on his achievements with the grant program; he responded by pointing out that much of the success of this program was due to the active cooperation of WAS members who gave much time and thought to the prosecution of the work.

Dr. Taylor announced that at the instigation of Raymond Seeger, a committee of women in science had been set in motion to stimulate the adoption of science careers by girls, and to advocate the teaching of science in girls' schools. Chairman of the committee is Katherine Way, who welcomes any further volunteer assistance.

Following the second reading of their names,

the following persons were elected to membership in the Academy: Louis S. Baron, Edward Hacskaylo, Thomas J. Henneberry, James L. Hilton, Miss Etsuko Osawa, Robert O. Belsheim, John P. Craven, Robert M. Rivello, Raul Rodriguez, Cecil T. Wint, James W. Butler, Theodore A. Litovitz, Paul E. Ritt, Carl F. Romney, William J. Thaler, Marvin Zelen, Pauline Diamond, and Mrs. Tempie R. Franklin.

The treasurer asked that all officers and committee chairmen authorized to obligate budgeted funds should have bills sent to themselves, approve them if proper, and forward to him for more prompt handling and payment.

SCIENCE AND DEVELOPMENT

A new building at Catholic University to house the Department of Biology is expected to be ready for occupancy before the end of the academic year. It is a four-story building with a greenhouse and related facilities on the roof. There will be extensive animal house facilities and specially equipped laboratories for animal physiology on the top floor. Laboratories for plant physiology and bacteriology will be located on the first floor. There will also be a herbarium, teaching laboratories, media and transfer rooms, a large lecture room, library, and office-laboratories for staff members.

This Nation's first measurement science center opened at George Washington University the week of February 2. The program was organized by the school of engineering in cooperation with the National Bureau of Standards and assistance of the Martin Company of Baltimore. The Center will provide a curriculum in measurement science. About one third of the enrollees are graduate students from government and industry. The remainder are undergraduates in engineering. Eight courses in metrology will be offered which can be credited toward the requirements for an engineering certificate or degrees of bachelor, master, or doctor of science.

A summary of United States earthquakes in 1958 has been published by the Coast and Geodetic Survey. It describes earthquake activity in the United States and dependencies in 1958, and summarizes the earthquake locations obtained by processing reports from many foreign and domestic seismograph stations. This information is useful in mapping seismic areas and promoting public safety through better understanding of earthquake phenomena. The publication includes a list of Coast and Geodetic Survey and cooperating teleseismic stations.

A Center for Research in Child Development is to be established at the National Institutes of Health. It was authorized by the Public Health Service Surgeon General in a memorandum dated February 17. The new Center will be responsible for a program to encourage and stimulate development and exploratory research in basic biological, behavioral, and clinical sciences related to the phenomena and health problems of childhood and adolescence.

Larc, the fastest and most powerful ultra-high-speed calculator available to the Department of Defense, has successfully completed acceptance tests at the Applied Mathematics Laboratory of the U. S. Navy David Taylor Model Basin. It is capable of storing 3 million 12 digit numbers or 3 million computer words on high-speed magnetic drums, and 30,000 words or numbers in ultra-high-speed core storage. It can perform 250,000 multiplications, additions, subtractions, or comparisons per second.

A portable reflectance spectrophotometer, the first of its kind, to measure surface reflectance of soils and vegetation in natural environment is being tested by the U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va. Reflectance data obtained by this instrument has many applications to engineering, mineral, and water surveys as well as military problems. This instrument makes it possible to examine soil and vegetation in an undisturbed state. Previously samples had to be taken to the laboratory for measurements. The reflectance properties of undisturbed and disturbed samples are often markedly different. Reflectance data obtained in the field with this instrument have provided accurate information on which to base selection of film filter combinations with optimum characteristics for registering a desired tone contrast between objects in photographs.

Measurement of natural gamma ray radiation of raw (grease) wool is a promising new method for predicting wool shrinkage. The gamma rays are emitted by a natural isotope, potassium-40, that occurs mostly in the suint (dried sweat) of raw wool. Research by USDA scientists R. Kulwich, L. Feinstein, R. W. Decker, and C. Golumbic of AMS and Mary E. Hourihan and C. E. Terrill of ARS has shown that this radiation can be measured with a newly-developed, highly sensitive low-level-gamma ray detector. The measurement would indicate the amount of impurities (grease, suint, and dirt) which are removed in scouring and account for most of the shrinkage. The present method of predicting the yield of clean wool involves scouring and weighing small samples. The new method would be faster since no special preparation of the wool would be

necessary. The wool sample would merely be placed in a fiber drum for analysis.

Development of a new electrostatic device to speed measurement of the fineness of wool-fibre sections has been announced by the U. S. Department of Agriculture. The device was developed under a contract by H. G. Neil of the Special Instruments Laboratory, Knoxville, Tenn., in collaboration with wool fiber technologist Mary E. Hourihan of the Department's Beltsville Research Center. The new instrument arranges the fibers in parallel so they can be measured more easily and faster than by present methods. The aligned fiber sections, mounted in oil, are measured indirectly under a microprojector that produces an image larger than the actual fibers of a standard magnification. The images cast by the projector are measured quickly with a wedge scale. Having the fibers aligned makes it possible to measure the fibers more accurately and with a minimum turning of the wedge scale.

The severe snowy winter that the Washington area has recently experienced was anticipated by Weather Bureau scientists early in December. They noted that wind patterns around the Northern Hemisphere were reshaping themselves and predicted that they would bring the two necessary ingredients for a cold and snowy winter if they persisted. The first ingredient was a supply of cold air from Canada. The second was a flow of warmer moist air from the Gulf of Mexico and the Pacific Ocean. The first of these conditions by itself would result in cold dry weather. The second by itself would cause warm, cloudy, rainy weather. The two together in proper combination would cause cold snowy weather. That is what has happened in the Washington and Northeast areas since early December.

Filterable viruses, invisibly minute semi-organisms which cause some of the most devastating epidemics, usually are latent in human tissues, apparently causing no harm. They may remain thus for years, then suddenly turn vicious. This is stressed in a report on current concepts and advances in virus research published in the latest annual report of the Smithsonian Institution.

The viruses suddenly can mutate to form new strains and cause different disease symptoms. They may have quite different effects depending on the age, genetics, state of nutrition, and balance of the hormones of the host. "Conversion of a virus from a latent to an active state," says the report, "may be effected by seasonal factors. For instance, there is a tendency for polio to occur in the summertime, or for sun and wind, somehow related to the seasons, to influence the emergence of herpetic lesions. There are also hormonal factors, such as those associated with pregnancy, that influence whether or not polio will result in paralysis."

"X-ray Protection up to Three Million Volts," National Bureau of Standards Handbook 76, was issued in February and is available from the Superintendent of Documents at 25 cents. This 52-page pamphlet sets forth standards of safety established by Subcommittee 3 of the National Committee on Radiation Protection and Measurement. It contains data and recommendations pertaining to all persons involved, including the manufacturers of the apparatus, designers and builders of the rooms housing it, the individuals in charge of installations, and the persons actually using the equipment. The Committee's basic philosophy on X-ray protection, according to a statement in the preface, is the same as expressed 30 years ago, namely, that unnecessary radiation exposure should always be avoided and all exposure held to the minimum compatible with practical clinical requirements.

A record-breaking total of 75,000 new chemical compounds was reported by the world's chemists in 1960. About a fourth of the new chemicals—19,000—were made by American scientists; Iron Curtain chemists reported approximately 9,000 new chemicals, while the Japanese accounted for almost 7,000 compounds. Other top chemical-producing countries include England and Germany.

The first cumulative index of *Index Chemicus*, published by the Institute for Scientific Information, Philadelphia, marks the first time that this information has been reported so promptly. The index was prepared by electronic computing equipment in record-breaking time—a historic achievement in chemical documentation. Prior to the introduction of *Index Chemicus* in August 1960, chemists had to wait from two to five years to obtain this same information from conventional abstracting services. Now the information is available within 60 days.

Secretary of Agriculture Orville L. Freeman will open the OPEDA Science Fair Exhibit on April 26 in the Agriculture Department patio, at 9:30 a.m. Sponsored by the Organization of Professional Employees of the Department of Agriculture, the exhibit will provide an opportunity for about 50 Washington Area high school students to put their scientific skills and ingenuity on public display following the science fairs in their own areas. At this fourth annual event, science teachers of the area are particularly invited to bring their classes to visit the exhibit, which will be on view through April 28.

Delegates for 1961 to the Washington Academy of Sciences, Representing the Local Affiliated Societies

Philosophical Society of Washington	Lawson M. McKenzie
Anthropological Society of Washington	Regina Flannery Herzfeld
Biological Society of Washington	Herbert Friedmann
Chemical Society of Washington	John L. Torgesen
Entomological Society of Washington	William E. Bickley
National Geographic Society	Alexander Wetmore
Geological Society of Washington	Margaret D. Foster
Medical Society of the District of Columbia	Frederick O. Coe
Columbia Historical Society	U. S. Grant, III
Botanical Society of Washington	Harold T. Cook
Society of American Foresters	G. Flippo Gravatt
Washington Society of Engineers	Howard S. Rappleye
American Institute of Electrical Engineers	William A. Geyger
American Society of Mechanical Engineers	William G. Allen
Helminthological Society of Washington	Doys A. Short
Society of American Bacteriologists	Mary Louise Robbins
Institute of Radio Engineers	Robert D. Huntoon
American Society of Civil Engineers	Douglas E. Parsons
Society for Experimental Biology and Medicine	Kathryn Knowlton
American Society for Metals	John A. Bennett
International Association for Dental Research	Gerhard Brauer
Institute of the Aerospace Sciences	Francois N. Frenkiel
American Meteorological Society	Jack Thompson
Insecticide Society of Washington	Milton S. Schechter
Acoustical Society of America	Richard K. Cook
American Nuclear Society	Urner Liddel